ORIGINAL ARTICLE

Postoperative complications from primary repair of cleft lip and palate in a semi-urban Nigerian teaching hospital

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ABSTRACT

Background: This paper seeks to investigate the incidence of short-term postoperative complications in children and adult patients undergoing primary surgery of cleft lip and palate. **Patients and Methods:** One hundred and fifteen patients consisting of children (below 12 years) and adult (12 years and above) who were operated for both cleft lip and palate within a 2-year period at the University of Maiduguri Teaching Hospital were reviewed postoperatively at 1 week, 2 weeks, 1 month, 3 months, 6 months, and 1 year intervals, respectively. The complications encountered within the periods of the review were recorded. **Results:** One hundred and twenty surgeries were performed on 115 patients (85 children 30 Adults). A total of 43 complications (31 in children and 12 in adults) were recorded over the study period. Eighteen (41.9%) of these complications were noticed in unilateral cleft lip repair, while 12 (27.9%) and 13 (30.2%) complications were observed in bilateral cleft lip and cleft palate surgeries, respectively. A higher complication rate (72.0%) was recorded in children compared with adults. Major complications (13.9%) were, however, observed more in adults than children. **Conclusion:** Although every surgeon attempts to prevent complications during surgery, they may still occur. The high complication rate observed in our study may be due to a small sample size. General complications observed among children are due to cross infection during a hospital stay, contributing immensely to the higher rate of complications in children. Moreover, this may be reduced by short hospital stay following surgery. We also advocate early contact with children with cleft, and early surgical intervention in other to prevent some of the major complications encountered in adult patients.

Key words: Cleft lip and palate, postoperative complication, primary repair

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INTRODUCTION

The ultimate goal of cleft lip and palate surgery is that the patients "look well, feed well, and speak well." To achieve these goals, much attention has been paid in the literature to the technique of repair and clinical outcomes of surgery, but little attention has been paid to morbidity and mortality accompanying cleft surgery.[1] In any case, some authorities believe that complication following cleft lip surgery is unusual.[2] The factors influencing the overall outcome of cleft repair are multiple and complex. Timing of cleft lip and palate repair remains controversial in the literature,[1] and compromise must be reached between the age of the patient at surgery and the surgical outcome with respect to facial growth, scarring, language development, and psychological factors.[3]

Morbidity and mortality rates for cleft lip and palate repairs are, however, difficult to compare because of the absence of a uniform classification of morbidity.[4]

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Improvement in pediatric anesthesia and surgical techniques has been reported to decrease the incidence of intraoperative and postoperative complications and has allowed more complex operations to be carried out at an earlier age.[5]

PATIENTS AND METHODS

One hundred and fifteen patients consisting of children (below 12 years) and adult (12 and above) patients who were operated for cleft lip alone, cleft palate alone, and cleft lip and palate combined within a 2-year period at the University of Maiduguri Teaching Hospital (a tertiary institution in the North Eastern Nigeria) were followed up at 1 week, 2 weeks, 1 month, 3 months, 6 months, and 1 year intervals, respectively. The study protocol was approved by the Research and Ethics Committee of the hospital, and informed consent forms were obtained from parents of participating children and the adult patients. A total of 120 cleft surgeries consisting of 90 cleft lip surgeries and closure of 30 cleft palates were done.

Unilateral cleft lips (UCLs) were repaired using Millard's rotation advancement flap technique[6] and Bilateral cleft lips (BCLs) were closed by Millard's myoplastic technique[6] at the earliest age of 3 months. Cleft palates were closed from 18 months using Von Langenbeck technique.[6] All surgeries for children with cleft lip and palate were carried out under general anesthesia, while cleft lip surgeries in adults were operated under conscious sedation using local anesthesia. All palate surgeries in adult and cleft lip surgeries in apprehensive adults were also operated under general anesthesia.

Postoperatively, patients who had cleft lip repair were discharged after 5–7 days, while those who had palate repair were discharged after 2 weeks. Postoperative complications were categorized as minor, major, and general[1] (complications not related to the operation). In the major category were excessive postoperative bleeding (in cleft lip and palate surgeries) and complete wound breakdown (only in cleft lip surgery and airway obstruction following palate surgery). In the minor category were partial wound separation, vermilion notching, stitch marks formation, hypertrophic/keloid scar formation following cleft lip surgery, and also fistula formation following cleft palate surgery. General complications include diarrhea, malaria, upper respiratory tract infection, and lower respiratory tract infection.

Collected data included age, sex, type of cleft, and types of complication associated were analyzed using Statistical Package for Social Sciences (SPSS) for windows student version 13.0 (SPSS Inc., Chicago, IL, USA).[7] Statistical significance was inferred at $P < 0.05$.

RESULTS

One hundred and twenty cleft surgeries were performed on 115 patients (85 children, and 30 adults) and patients followed up over a period of 1-year. The ages of the patients ranged from 3 months to 65 years. Of these surgeries, 18 were unilateral lip repair, 12 bilateral lip repair, while 13 were cleft palate surgeries (only 3 of these were isolated soft palate surgeries) [Table 1].

A total of 43 complications (31 in children, 12 were adults) were recorded over the study period, 18 (41.9%) of these complications were noticed in UCL repair, while 12 (27.9%) and 13 (30.2%) complications were observed in BCL and cleft palate surgeries respectively. Twelve (27.9%) minor complications occurred in 62 patients following UCL operation, and 9 (20.9%) was observed in bilateral cleft repair [Table 2]. A high complication rate of 72% was recorded among children which consist substantially of minor and general complications (complications due to cross-infection). However, more major complications were observed among adult patients. There was a significant statistical difference between children and adult with respect to all the complications (major, minor, and general complication) ($P < 0.05$) [Table 3]. Vermilion notching 38.1% was found to be the most common minor

Table 1: Complications in 120 cleft surgeries in children and adult

Age	Type of procedures			Number of procedures	Number of complication	Percentage of complication
	UCL	BCL	CP			
Children (*n*=85)	42	20	20	82	31	72.0
Adult (*n*=30)	20	8	10	38	12	28.0
Total	62	28	30	120	43	100

UCL – Unilateral cleft lip; BCL – Bilateral cleft lip; CP – Cleft palate

Table 2: Number of surgeries by types of complication

Types of cleft	Number	Complications (%)			Total (%)
		Minor	Major	General	
Unilateral cleft lip	62	12 (27.9)	4 (9.3)	2 (4.6)	18 (41.9)
Bilateral cleft lip	28	8 (18.6)	3 (7.0)	1 (2.3)	12 (27.9)
Cleft palate	30	3 (7.0)	2 (4.6)	8 (18.6)	13 (30.2)
Total	120	23	9	11	43 (100)

Table 3: Types of postoperative complications recorded after 120 cleft repair in children and adult

Types of complication	Children (%)	Adult (%)	*P*
Minor	17 (39.5)	6 (13.9)	0.025
Major	3 (6.9)	6 (13.9)	0.035
General	11 (25.6)	0	0.015
Total	31 (72.1)	12 (27.9)	0.027

complication in cleft lip surgeries seen in both children and adult, 6 and 2 cases, respectively [Table 4].

Postoperative bleeding was the only major complication observed in both unilateral and bilateral lip closure in adults, whereas in children complete wound breakdown was seen in three cases [Table 5]. Of the 30 palate surgeries performed, two patients had fistula in the anterior aspect of the hard palate and both were children [Table 6]. Three of these were children and one adult. There were two postoperative bleeding from the soft palate in two adults, and a case of airway obstruction was seen in an adult [Table 6].

Table 7 revealed a high incidence (25.6%) of general complications among children that underwent cleft surgery. Upper respiratory tract infection 46% was found to be the most frequent general complication recorded. No case of general complication was recorded among adult.

Table 4: Minor complications following cleft lip repair in children and adult

Minor complications	Children		Adult		Total (%)
	UCL	BCL	UCL	BCL	
Partial wound breakdown	2	2	1	1	6 (28.6)
Vermillion notching	4	2	1	1	8 (38.1)
Hypertrophic scar	3	2	1	1	7 (33.3)
Total	9	6	3	3	21 (100)

UCL – Unilateral cleft lip; BCL – Bilateral cleft lip

Table 5: Major complications following cleft lip repair in children and adult

Types of complication	Children		Adult		Total
	UCL	BCL	UCL	BCL	
Complete wound breakdown	1	2	-	-	3
Postoperative bleeding	-	-	1	3	4

UCL – Unilateral cleft lip; BCL – Bilateral cleft lip

Table 6: Types of complications following cleft palate surgeries in children and adult

Types of complication	Children	Adult	Total
Major			
Postoperative bleeding	-	2	2
Airway obstruction	-	1	1
Minor			
Fistula	2	-	2

Table 7: General complications following cleft repair in children

Types of complication	Cleft lip	Cleft palate	Total (%)
Diarrhea	1	2	3 (27.2)
Malaria	-	1	1 (9)
URTI	2	3	5 (46)
LRTI	-	2	2 (18.1)
Total	3	8	11 (100)

URTI – Upper respiratory tract infection; LRTI – Lower respiratory tract infection

DISCUSSION

The presence of cleft lip and palate has both esthetic and functional implications for patients in their social interactions, particularly on their ability to communicate effectively and on their facial appearance. Many surgical techniques have been advocated to improve the result of cleft surgery.[7] It is obvious that every surgeon attempts to prevent complications following these surgical procedures. However, the surgeon may be trapped unwittingly into some pitfalls. The incidence of surgical complications has been found out to be greater in patients who had lip repair in the 1st week of life. Death from complications due to lip repair is not frequently reported in the literature which indicates an insignificance.[1] Some authorities even believe that complication following cleft lip surgery is unusual.[2]

Our study revealed a high complication rate of 35.8%, most of which are minor complications 53.4%. Vermilion notching following lip repair forms a large percentage of the minor complication. This contrast the report of Wilhelmsen and Musgrave, which was as low as 13%.[1] This high rate may be due to small sample size recorded in this study. Wilhelmsen and Musgrave, however, urged that surgery should be delayed until the patient is 10 weeks, weighs at least 10 pounds, had a hemoglobin of at least 10 g, and a white cell count of <10,000. He observed that when these rules were followed complications were 5 times less.[1]

In previous studies, the type of cleft lip makes no demonstrable difference in the number or the nature of subsequent complications.[1] However, in this study, some notable difference was observed in BCL which has been brought about by proclined premaxilla, shortened prolabium, and the columella causing some tension at the suture line increasing the incidence of wound breakdown and scar formation. It has been the practice in our institution to commence elastic traction for patients with BCL, but the hindrance to this has been late presentation of patients and inadequate use of the appliance when the patients are at home. Therefore, early intervention by orthodontist is an inevitable solution to this problem.

Slight notching at the vermilion of the lip occurred in six children who had lip repair, and two cases were recorded in the adult [Figure 1]. The reason for this difference is not known. McCarthy and Court[8] attributed vermillion notching after cleft lip repair to excessive sacrifice of vermillion during primary repair or inadequate approximation of orbicularis oris muscle fibers.[9] Hypertrophic scar was noticed at 2 weeks postoperative review in five children [Figure 2] and two adults, respectively. Although the development of hypertrophic scar and keloids at incision sites following surgery have been reported to be relatively common among Blacks when compared with Caucasians, the etiology of this condition is still not clear.[10] Satisfactory improvement of some of the scars was noticed

Figure 1: Notching at the Vermilion following cleft lip repair in an adult

Figure 2: A child with hypertrophic scar following bilateral cleft lip repair

in the majority of children at 3 months of postoperative review. This probably maybe due to the greater healing potential commonly observed in the very young.[11] The partial wound breakdown observed among children in this study was at the reconstructed nasal floor. Contamination of surgical site from mucous secretion has been reported to be common in children.[6] Adekeye and Lavery,[6] however, attributed the wound dehiscence observed in his study to contamination of surgical site by the attending mothers. Sowemimo[12] opined that wound dehiscence in cleft surgery may sometimes be due to nosocomial infections from attending medical team. This informed the reason for early exposure of wound dressing after 72 h in our center.

The incidence of fistula formation following palate repair has been reported to be as high as 34%, and the severity of the original cleft has been shown to correlate with the risk of the fistulas.[13] In this study, fistula was only noticed among children. This, however, is attributed to insufficient palatal tissue available for advancement to the midline. However, some authors have reported infection in the wound as the major concern because it may be responsible for dehiscence of the tissues and development of fistulas.[14] Postoperative bleeding was noticed more in the adult patients. This may be due to the large size of vessels supplying the surgical site. In any case, sustained digital pressure was applied to arrest the hemorrhage in all the cases.

General complications were observed among children only at the rate of 25.6%, of which upper respiratory tract infection was most prominent. These are complications not directly related to the operation, majority of these general complications were as a result of long hospital stay on admission. This may be due to high susceptibility to infection of the children with low immunity common among children. Our findings contrast with those of other authors.[5] A large proportion of these complications was observed among patients who had cleft palate surgery and had to stay in the hospital for long. DeMay established in their study that reduction of hospital admissions and length of stay do not affect the outcome of cleft lip and palate surgery. They, however, hypothesized that the functionality of the patient family in postoperative care is an additional factor.[5] A reduction in hospital stay may reduce the number of general complications following cleft lip and palate surgery considerably. No mortality was recorded in this study. Wilhelmsen and Musgrave reported 0.34% mortality.[1]

The mortality ever following cleft repair occurred in 1953 in a 3-month-old white male child who died on the 2nd postoperative day due to viral pneumonia.

CONCLUSION

Complication rate in this study is comparatively high. This may be due to low sample size, future studies are therefore recommended. General complication contributes greatly to the higher rate of complication recorded in children. This may have been due to cross infection during long hospital stay among children. We strongly advise a reduction in the length of hospital stay, particularly after surgery. We also, however, advice early contact and treatment for patients with cleft because of the good healing potentials among children.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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